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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* KENDALL E. KEENE and JOHN C. VICIC

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Appeal 2009-004270  
Application 10/664,747  
Technology Center 3600

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Decided: January 29, 2010

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Before ERIC GRIMES, LORA M. GREEN, and STEPHEN WALSH,  
*Administrative Patent Judges.*

WALSH, *Administrative Patent Judge.*

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 (2002) from a Patent Examiner's rejection of claims 5-8, 12-16 and 19-28.<sup>1</sup> We have jurisdiction under 35 U.S.C. § 6(b) (2002). We reverse.

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<sup>1</sup> Claims 1-4, 9-11, 17 and 18 have been canceled. (App. Br. 2).

## STATEMENT OF THE CASE

“The field of this invention is sealing annular spaces in wellhead or downhole applications and, more particularly, where low temperature exposure to the seal assembly is anticipated.” (Spec. 1.)

Claims 5, 19 and 28 are the only independent claims in the application and they read as follows:

5. A seal assembly for closing off an annular space between a first and second body and supported by at least one of said first and second bodies, comprising:

- an annularly shaped body having an upper and a lower end and a longitudinal axis;
- and

- at least one backup ring mounted on one of said ends of said body and having a relaxed dimension greater than the annular space between said first and second bodies so that opposed ends on said backup ring must be compressed to be inserted in the annular space, said backup ring further comprising a bend between said opposed ends to store a force created by insertion of said backup ring into the annular space and apply said force on said opposed ends against said first and second bodies;

- said body comprises at least one first ring in a first groove, said first groove having a bottom and a first circumference at said bottom;

- the circumference of said first ring at a location nearest said first circumference of said first groove differs before mounting from said first circumference of said first groove so as to apply a net radial force to said body in a direction substantially perpendicular to said longitudinal axis.

19. A seal assembly for closing off an annular space between a first and second body and supported by at least one of said first and second bodies, comprising:

- an annularly shaped body having an upper and a lower end and a longitudinal axis;

- said body comprises at least one first ring in a first groove, said first groove having a bottom and a first circumference at said bottom;

the circumference of said first ring at a location nearest said first circumference of said first groove differs before mounting from said first circumference of said first groove so as to apply a net radial force to said body in a direction substantially perpendicular to said longitudinal axis.

28. A seal assembly for sealing an annular space between first and second bodies, comprising:

- an annularly shaped body having first and second ends, and at least one notched portion disposed between the first and second ends;
- at least one backup ring disposed on one of the first or second ends, the backup ring comprising:

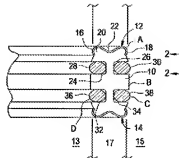
- a pair of loop ends extending toward the annularly shaped body and configured to secure the backup ring to the annularly shaped body;

- an inflected portion located between the loop ends and in abutment with the annularly shaped body, wherein the inflected portion facilitates elastic deformation of the backup ring;
- and

- a sealing ring disposed in the notched portion of the annular body and configured to provide a biasing force in a radially inward direction with respect to the annular body.

Figure 1 from the Application, reproduced below, illustrates one embodiment of the claimed annular seal assembly. (Spec. 3).

FIG. 1



{Figure 1 illustrates a sectional view of the preferred embodiment of the annular seal of the invention. (*Id.*).}

### THE EVIDENCE

The Examiner relies upon the following as evidence in support of the rejections:

Taylor	3,869,132	Mar. 4, 1975
Vanderford	4,381,114	Apr. 26, 1983
McEver	4,496,162	Jan. 29, 1985
Kilmoyer	4,553,759	Nov. 19, 1985

### THE REJECTIONS

The following rejections are before us for review:

1. Claims 19 and 27 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kilmoyer.
2. Claims 20-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kilmoyer.
3. Claims 5-8, 12-16 and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Kilmoyer, Vanderford and McEver.

4. Claims 19-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of McEver and Kilmoyer.
5. Claims 23-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over McEver, Kilmoyer and Vanderford.
6. Claim 28 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over McEver, Vanderford, Taylor and Kilmoyer.

## ANTICIPATION

### *Issue*

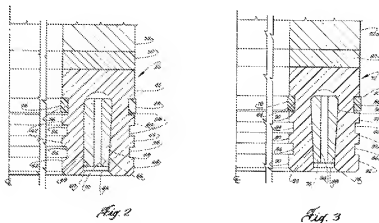
Have Appellants established that the Examiner erred in determining that the prior art anticipated a seal assembly having an annularly shaped body comprising a first ring in a first groove wherein “the circumference of said first ring at a location nearest said first circumference of said first groove differs before mounting from said first circumference of said first groove so as to apply a net radial force to said body in a direction substantially perpendicular to said longitudinal axis?”

## PRINCIPLES OF LAW

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). “Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (citations omitted)

## FINDINGS OF FACT

1. Kilmoier described an improved valve with a stem seal including a body having a valve chamber. (Kilmoier, Abstract).
2. Kilmoier Figures 2 and 3 are reproduced below:



{Figures 2 and 3 show similar partial sectional views of a seal of Kilmoier's invention. (*Id.* 2:29-33).}

3. Kilmoier disclosed “[i]nner and outer soft seal rings 46 and 48 are positioned in the closest of inner and outer grooves 56 and 58, respectively, to the closed end of sealing ring 42....” (*Id.* 3:6-9).
4. Kilmoier disclosed “[s]eal rings 46 and 48 each have a cross-sectional area greater than the cross-sectional area of the groove in which they are positioned to ensure that they are held in sealing engagement with the surface against which they are intended to seal.” (*Id.* 3:9-14).
5. Kilmoier did not explicitly disclose that the circumference of seal ring 46 or 48 at a location nearest the bottom of its respective groove differs before mounting from the circumference of the bottom of groove so as to apply a net radial force to said body in a direction substantially perpendicular to the valve's longitudinal axis.

## ANALYSIS

The Examiner found that Kilmoyer described the claimed seal. (Final Rej., Jan. 19, 2008, p. 3). In particular the Examiner found that Kilmoyer described an annularly shaped body comprising a first ring 80 in a first groove 86. (*Id.*). According to the Examiner, the circumference of ring 80 differs from, i.e., is greater than, the circumference of the groove 86 so as to apply a net radial force to the body in a direction substantially perpendicular to the longitudinal axis. (*Id.*)(citing Kilmoyer Fig. 3).

Appellants challenge the Examiner's rejection of claims 19 and 27 by asserting that Kilmoyer did not describe a seal body "where the circumference of the first ring at a location nearest the bottom of the first groove differs before mounting 'so as to apply a net radial force to said body in a direction substantially perpendicular to said longitudinal axis,' as recited in claim 19." (App. Br. 14). Appellants assert that Kilmoyer instead described a seal body "wherein the first ring has a greater cross-sectional area than the groove in which it rests." (*Id.*). According to Appellants, Kilmoyer did not "mention a circumferential relationship between the ring and the groove much less a relationship resulting in a net radial force applied to the annular seal body." (*Id.*).

Appellants further assert that Kilmoyer did not inherently anticipate the circumferential relationship between the ring and the groove because "such a relationship is not 'necessarily present.'" (*Id.*). According to Appellants, Kilmoyer's seal involves an outward radial force applied to the soft seal ring by the load ring 44 which allows the assembly to function even



if the soft seal rings sat loosely in the groove prior to load ring insertion. (*Id.* 14-15).

We agree with Appellants that the Examiner has not established that Kilmoyer described a seal assembly comprising an annular body in which “the circumference of said first ring at a location nearest said first circumference of said first groove differs before mounting from said first circumference of said first groove so as to apply a net radial force to said body in a direction substantially perpendicular to said longitudinal axis,” as recited in independent claim 19. The Examiner did not find that Kilmoyer expressly described a circumferential relationship. Indeed, as the Appellants have asserted, Kilmoyer described the elements in terms of a difference in cross-sectional area. The Examiner reasoned that (a) “the ring 46 or 48 ensure a preload on the sealing lips,” and (b) “if one applies a radial outward force then the seal rings would counter act that radial outward force to provide radial inward force to the lips having the grooves 56 and 58.” (*See* Ans. pp. 18-19). We do not find this reasoning sufficient to show that Kilmoyer’s rings necessarily had the claimed circumferential relation to the grooves. The explanation is therefore insufficient to establish that Kilmoyer inherently anticipated the claims.

## OBVIOUSNESS

### *Principles of Law*

“If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability.” *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740 (2007). When determining whether a claim is obvious, an Examiner must make “a searching comparison of the claimed

invention – including all its limitations – with the teaching of the prior art.”  
*In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995).

A. *Claims 5-8, 12-16 and 19-26*

*Issue*

Have Appellants established that the Examiner erred in determining that it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a seal assembly having an annularly shaped body comprising a first ring in a first groove wherein “the circumference of said first ring at a location nearest said first circumference of said first groove differs before mounting from said first circumference of said first groove so as to apply a net radial force to said body in a direction substantially perpendicular to said longitudinal axis?”

*Analysis*

Independent claim 5 and its dependent claims 6-8, 12-16, and 26 along with independent claim 19 and its dependent claims 20-25 each stand rejected under 35 U.S.C. § 103(a) as being unpatentable over prior art including Kilmoyer. As part of findings concerning the scope and content of the prior art for each of these rejections, the Examiner found that Kilmoyer disclosed the following claim limitation:

the circumference of said first ring at a location nearest said first circumference of said first groove differs before mounting from said first circumference of said first groove so as to apply a net radial force to said body in a direction substantially perpendicular to said longitudinal axis.

(See Non-Final Rejection, pp. 4-13; Claims App.'x, pp. 35-38). As discussed, *supra*, we do not find that Kilmoyer described this claim limitation. The Examiner has not provided any rationale on which to conclude that the missing claim limitation would have been obvious based on Kilmoyer. Consequently, we do not find that the Examiner has established this claim limitation would have been obvious over Kilmoyer. Accordingly, we reverse the Examiner's obviousness rejections of claims 5-8, 12-16 and 19-26.

*B. Claim 28*

*Issue*

Have Appellants established that the Examiner erred in determining that it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a seal assembly comprising “a sealing ring disposed in the notched portion of the annular body and configured to provide a biasing force in a radially inward direction with respect to the annular body?”

*Analysis*

Appellants assert that “the Examiner has failed to establish a *prima facie* case of obviousness with respect to claim 28 because the stated combination fails to disclose ... a sealing ring disposed in the notched portion of the annular body and configured to provide a biasing force in a radially inward direction,” as recited in claim 28. (Reply Br. 16; App. Br. 32).

In our review of the Examiner's rejection and Answer, we find no evidence that the Examiner accounted for the disputed claim limitation by referencing any teaching from the combined prior art. (*See* Ans. 13-14 and 25). Consequently, we agree with Appellants that the Examiner has not established that claim 28 would have been obvious over combined references. Accordingly, we reverse the Examiner's rejection of claim 28.

### CONCLUSION

On the record before us, the Examiner has not established that claims 19 and 27 are anticipated by the cited prior art.

Additionally, the Examiner has not established on this record that claims 5-8, 12-16 and 19-26 and 28 would have been obvious to one of ordinary skill in the art at the time the invention was made.

### DECISION

The Rejection of claims 19 and 27 under 35 U.S.C. § 102(b) as being anticipated by Kilmoeyer is REVERSED.

The Rejection of claims 20-22 under 35 U.S.C. § 103(a) as being unpatentable over Kilmoeyer is REVERSED.

The Rejection of claims 5-8, 12-16 and 26 under 35 U.S.C. § 103(a) as being unpatentable over the combination of McEver, Vanderford and Kilmoeyer is REVERSED.

The Rejection of claims 19-22 under 35 U.S.C. § 103(a) as being unpatentable over the combination of McEver and Kilmoeyer is REVERSED.

The Rejection of claims 23-25 under 35 U.S.C. § 103(a) as being unpatentable over McEver and Kilmoeyer is REVERSED.

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The Rejection of claim 28 under 35 U.S.C. § 103(a) as being unpatentable over McEver, Vanderford, Taylor and Kilmoyer is REVERSED.

REVERSED

lp

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